UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DAVID KAZMER
and LIANG ZHU

Appeal 2007-3703
Application 09/578,108[1]
Technology Center 2600

Decided: November 27, 2007

Before KENNETH W. HAIRSTON, LEE E. BARRETT, and ROBERT E. NAPPI, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION ON APPEAL

1This is a decision on appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 1-39. We have jurisdiction pursuant to 35 U.S.C. § 6(b).

We reverse.

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[1] Application for patent filed May 24, 2000, entitled "Performance-Based Representation for Support of Multiple Decisions."

BACKGROUND

The claims are directed to a graphical user interface to assist a system designer in the solution of multivariate optimization problems as succinctly described in the Summary of Invention (App. Br. 2-3).

Claim 1 is illustrative:

> 1. A computer-implemented display system for visualizing the effect of selected values of a plurality of design variables on a plurality of performance attributes, said display system comprising:
>
> a processor having an input for accepting instructions and an output for driving a visual display;
>
> a plurality of control graphs generated on said display using said output of said processor, at least one of said control graphs illustrating an effect of a first design variable on a first performance attribute;
>
> a plurality of performance graphs generated on said display using said output of said processor, at least one of said performance graphs showing a relationship between said first performance attribute and a second performance attribute;
>
> a plurality of decision graphs generated on said display using said output of said processor, at least one of said decision graphs showing a relationship between said first design variable and a second design variable; and
>
> a design-interface coupled to said input of said processor, said design-interface enabling a user to manipulate said first design variable to control said first performance attribute.

THE REFERENCES

Sugino	5,287,284	Feb. 15, 1994
Daniel, Jr. (Daniel)	6,289,299	Sep. 11, 2001

THE REJECTIONS

Claims 1-3, 5-8, 11, 14-21, 24, 27-34, and 37 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Sugino.

Claims 4, 9, 10, 12, 13, 22, 23, 25, 26, 35, 36, 38, and 39 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Sugino and Daniel.

The rejection of claims 1-39 under 35 U.S.C. § 112, second paragraph, has been withdrawn (Ans. 3).

DISCUSSION

Claims 1-39 are grouped to stand or fall together (App. Br. 4). Claim 1 is analyzed as representative.

The first step in the patentability analysis is to interpret any claim limitations that are in dispute. This is an especially critical step in this case in order to determine whether Sugino teaches the graphs recited in claim 1. The following terms are defined in the Specification:

design variable — An independent variable $x_1, x_2, \ldots x_n$. The design vector $\mathbf{X} = \{ x_1, x_2, \ldots x_n \}$ (spec. 5).

These are variables whose values the designer specifies directly. Design variables are used to control values of "performance

attributes."

performance attribute	A dependent variable $y_1, y_2, \ldots y_n$, each of which is a design objective (spec. 5). Each y_i is a function of the design vector **X**, $y_i = f_i(\mathbf{X})$ (spec. 5). These are variables whose values are controlled by the decision variables.
control graph	A graph showing the relationship between a design variable and a performance attribute (spec. 1-2 and claim 1).
performance graph	a graph showing the relationship between two different performance attributes (spec. 2 and claim 1).
decision graph	a graph showing the relationship between two different design variables (spec. 2 and claim 1).

In the example in the Specification for the design of a beam shown in Figure 9, there are four geometric design variables (x_1 = height, x_2 = width, x_3 = middle-thickness, x_4 = bottom thickness) and three performance attributes (y_1 = cross section area, y_2 = static deflection, y_3 = stress) (spec. 10-11). There are constraints on the design variables and the performance attributes (spec. 11). The set of control graphs (design variable versus performance attribute) is shown in Figure 10. The set of decision graphs (the relationship between two different design variable) is shown in

Figure 11. A performance graph (the relationship between two different performance attributes) is shown in Figure 12.

Based on this understanding, we examine the rejection over Sugino.

Appellants first argue that the graphs in Sugino appear to be illustrative drawings intended to assist the reader in understanding the disclosure, and not graphs that are shown on a display (App. Br. 14). The Examiner refers to column 6, lines 1-13. Appellants argue that this passage merely describes a particular design problem that Sugino intends to discuss and does not suggest that any of the graphs pointed to by the Examiner are ever generated on a display as recited in claim 1 (Reply Br. 2).

We agree with Appellants that Sugino does not disclose, at column 6 or elsewhere, that the graphs are generated on a display. However, since the rejection is based on obviousness, we conclude that a person of ordinary skill in the art would have been motivated to display any information that is being operated on by the computer, such as the graphs shown in Figure 7, as a means to check that the information is correct. In any case, this is not the major deficiency of Sugino.

Appellants' main argument is that the Examiner does not explain which graphs in Sugino correspond to the decision, performance, and control graphs. It is argued that the graphs in Sugino all correspond to "control graphs" because they illustrate a graph of a design variable on one axis and a performance attribute on the other axis (App. Br. 14-17; Reply Br. 2-5). Appellants address each graph in Sugino individually (App. Br. 15-17).

The Examiner attempts to explain why Sugino teaches decision and performance graphs (Ans. 5-10).

The Examiner's reasoning is not persuasive. For example, the Examiner considers Figures 4A and 5 to be "decision graphs" (Ans. 5-6). After describing Figures 4 and 5, based on the description at column 7, lines 3-33 of Sugino, the Examiner states that "a person skilled in the art could interpret the first/second/. . . design variables of Appellant corresponds to variation in chip pad length (l), the distance of chip pad from lower/upper side (d) and the chip pad height (x) of Sugino in fig. 4A" (Ans. 6). Figure 5 in Sugino discloses a graph with the "chip pad position" on the abscissa expressed as the chip pad height x = d/D using the symbols in Figure 4A (col. 7, ll. 19-22). This is a "design variable" as defined in this application because it is a variable controlled by the designer. The ordinate of the graph is labelled "chip pad." It is not clear exactly what is meant, but it apparently is a value determined from a "strength analysis from the stress on the upper/lower side of the chip pad shown in FIG. 4" (col. 7, ll. 17-19) and represents a "performance attribute" as defined in this application because it is determined from the design variable. The Examiner has not explained how the ordinate represents a design variable. Accordingly, the Examiner has not established that Sugino teaches "decision graphs."

The Examiner considers Figure 10 to be a "performance graph," apparently because it shows two design variables f_1 and f_2 on one axis and a design variable x on the other axis (Ans. 6). Appellants argued that if the

variables are all design variables, by definition, this cannot be a performance graph (Reply Br. 5).

The two variables f_1 and f_2 are properly characterized as "performance variables" since they are each a function of x. The graphs (f_1 as a function of x and f_2 as a function of x) are properly characterized as "control graphs" under Appellants' definition (App. Br. 17). If the graph was a graph of f_1 on one axis and f_2 on the other axis, this would be a performance graph, but this is not the case. Accordingly, the Examiner has not established that Sugino teaches "performance graphs."

We find that Sugino does not disclose or suggest a "decision graph" or a "performance graph," as recited in claim 1, for essentially the reasons stated in the Appeal Brief and the Reply Brief. The rejection of claims 1-3, 5-8, 11, 14-21, 24, 27-34, and 37 over Sugino are reversed. Daniel does not cure the deficiencies of Sugino. Thus, the rejection of claims 4, 9, 10, 12, 13, 22, 23, 25, 26, 35, 36, 38, and 39 is also reversed.

CONCLUSION

The rejections of claims 1-39 are reversed.

REVERSED

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FISH & RICHARDSON PC
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022